TPV593

Advance Information

The RF Line

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UHF Linear Power Transistor

25 V — 470–860 Mhz
UHF LINEAR
POWER TRANSISTOR
NPN SILICON

. . . designed for pre-driver and driver stages in band IV and V TV transposers and transmitter amplifiers. The TPV593 uses gold metallized die with diffused emitter ballast resistors to enhance reliability, ruggedness and linearity.

- Band IV and V (470–860 MHz)
- 2 W — P_{ref} @ −60 dB IMD
- 25 V — V_{CC}
- High Gain — 9 dB Typ, Class A, f = 860 MHz

CASE 244C-01, STYLE 1
(.280 SOE)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	25	Vdc
Collector-Base Voltage	V_{CBO}	45	Vdc
Emitter-Base Voltage	V_{EBO}	4	Vdc
Collector Current — Continuous	I_C	1.2	Adc
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	65 to +200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (T_C = 70°C)	$R_{\theta JC}$	11	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 80 mA, I_B = 0)	$V_{(BR)CEO}$	25	—	—	Vdc
Collector-Base Breakdown Voltage (I_C = 10 mA, I_E = 0)	$V_{(BR)CBO}$	45	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 1 mA, I_C = 0)	$V_{(BR)EBO}$	4	—	—	Vdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 250 mA, V_{CE} = 20 V)	h_{FE}	10	—	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 25 V, I_E = 0, f = 1 MHz)	C_{ob}	—	—	10	pF
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain (V_{CC} = 25 V, P_{out} = 2 W, f = 860 MHz, I_C = 450 mA)	G_{PE}	8.5	9	—	dB
Intermodulation Distortion, 3 Tone (f = 860 MHz, V_{CE} = 25 V, I_E = 450 mA, P_{ref} = 2 W, Vision Carrier = 8 dB, Sound Carrier = 7 dB, Sideband Signal = 16 dB, Specification TV05001)	IMD_1	—	—	58	dB

This document contains information on a new product. Specifications and information herein are subject to change without notice.

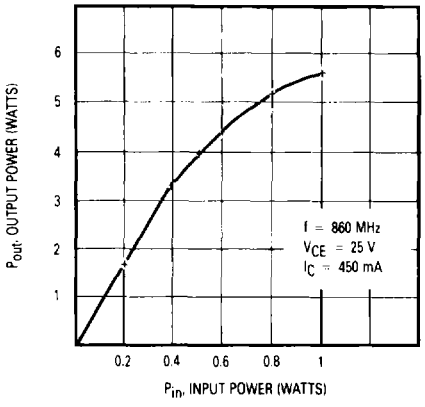

Figure 1. Output Power versus Input Power

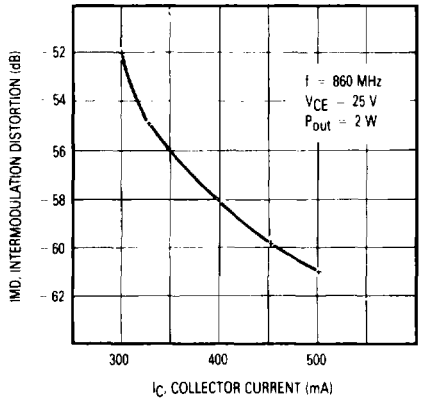

Figure 2. IMD versus Collector Current

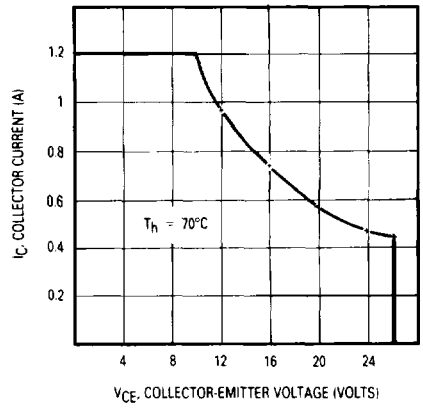

Figure 3. DC Safe Operating Area

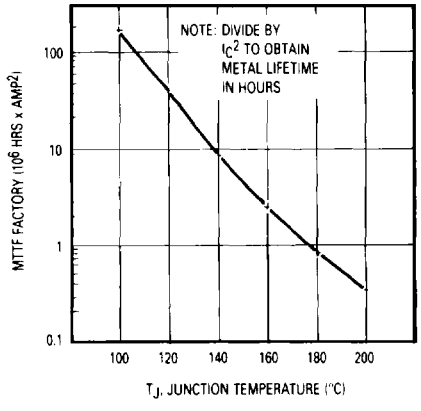

Figure 4. MTTF versus Junction Temperature

POLAR « S » PARAMETERS IN 50 OHMS SYSTEM

f	S11		S21		S12		S22		S21	K
MHz	MAGN	ANGL	MAGN	ANGL	MAGN	ANGL	MAGN	ANGL	dB	FACTOR
470	0.93	170°	1.5	63	0.04	50°	0.55	– 166°	3.52	1.01
650	0.93	165°	1.06	50	0.05	54°	0.60	– 169°	0.51	1.04
860	0.92	162°	0.79	38	0.06	54°	0.65	– 169°	– 2	1.15

NOTE: V_{CE} = 25 Volts – I_C = 450 mA — Class A

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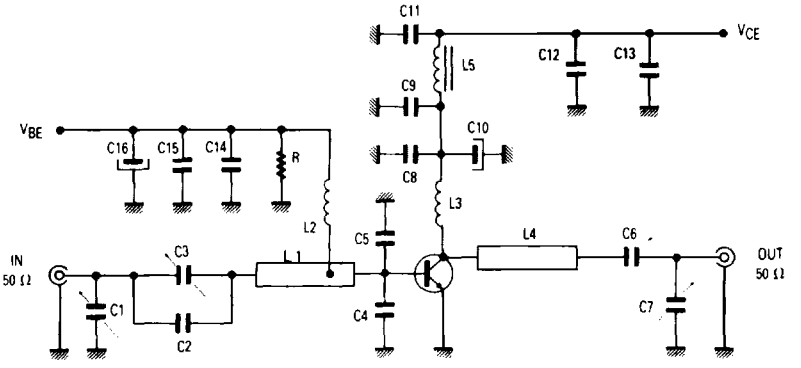

C1 — AIR TRIMMER AT 5201 0.8–10 pF TEKELEC
C2 — CHIP ATC 4.7 pF
C3 — AIR TRIMMER AT 5751 0.6–6 pF TEKELEC
C4, C5 — CHIP ATC 3.3 pF
C6, C7 — AIR TRIMMER AT 5501 1–20 pF TEKELEC
C8, C13, C14 — 1 nF CHIP CAPACITOR
C9, C11, C15 — 10 nF RTC
C12 — 0.1 μF RTC
C10, C16 — 10 μF 63 V electrolytic

L1 — 30 Ω line 1 6.5% Ag
L2 — choke 0.47 μH
L3 — 1 turn — ID 6 mm — wire 10/10
L4 — 30 Ω line 1 19% Ag
L5 — 8 turns on a CN 20 FERRITE BEAD — CERAMICL — MAGNETICS
R — 43 Ω 1/4 Watt

Figure 5. 860 MHz Test Circuit

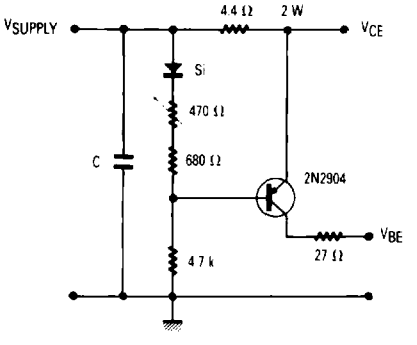

Figure 6. Bias Circuit

POLAR COORDINATES OF SIMULTANEOUS CONJUGATE MATCH IN 50 OHMS SYSTEM

F	SOURCE REFL. COEFF		LOAD REFL. COEFF		G MAX
MHz	MAGN	ANGLE	MAGN	ANGLE	dB
470	0.99	— 173°	0.91	124°	15.2
650	0.99	— 168°	0.83	134°	12.0
860	0.95	— 165°	0.79	146°	9.2

NOTE : V_{CE} = 25 Volts — I_C = 450 mA — Class A